Acta Neurochir (Wien) (1987) 85: 125–127

Acta Neurochirurgica

Tumours of the Thalamic Region

A Retrospective Study of 27 Cases

J. W. F. Beks, G. J. Bouma, and **H. L. Journée**

Department of Neurosurgery, University Hospital Groningen, The Netherlands

Summary

Twenty seven patients with thalamic tumours were evaluated retrospectively in the Neurosurgical Clinic of the University Hospital in Groningen between 1969 and 1983. The diagnosis was based on neuroradiological studies.

The authors recommend stereotactic biopsy of thalamic tumours followed by irradiation in selected cases.

Introduction

Tumours of the thalamic region are rare and the literature contains relatively few reports of thalamic tumours.

Approximately 1 percent of intracranial neoplasms are located in the thalamus[8]. Most of these tumours are anaplastic and are classified as malignant astrocytomas or glioblastomas.

Clinical Data

The patients comprised 13 males and 14 females. Their ages at the time of diagnosis of the tumour ranged from 2.2 years to 70.5 years with a mean of 25.5 years (Fig. 1).

In 8 patients symptoms had been present for 1 month or less before the diagnosis was made; in 6 patients between 1 and 2 months; in 4 patients between 2 and 6 months; in 2 patients between 6 and 12 months; in 6 patients between 1 and 3 years and 1 patient for over 3 years.

The average duration of the symptoms prior to the diagnosis was 7.6 months. The most common presenting symptoms and signs were referable to increased intracranial pressure or to a focal neurological deficit. Twenty patients had symptoms of increased intracranial pressure: headache, vomiting and drowsiness or vague symptoms such as dizziness, light headedness, fatique and irritability. Fifteen patients had visual symptoms such as diminished acuity. Thirteen patients had a hemiparesis (Table 1).

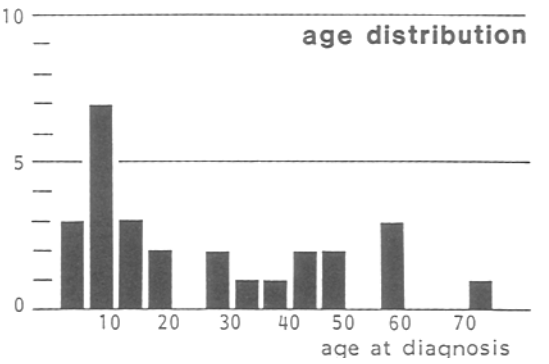

Fig. 1

Table 1. *Symptoms on Admission*

Symptom or sign	n	%
Headache	15	56
Papilledoema	20	74
Hemiparesis	13	48
Altered sensorium	5	18
Sensory deficit	2	7
Seizures	5	18
Hemi anopsia	15	56

Radiographic Diagnosis

We included all tumours thought to arise from the thalamus. Radiological methods used to investigate these patients reflected the development and application of special neuro-radiological procedures in the last decades. All patients had plain X-ray examinations of the skull, 6 had cerebral pneumo-encephalograms (ventriculography) investigated in the era before computer-tomography became available and 21 were examined by computer tomography.

Plain skull X-rays showed signs of increased intracranial pressure in 16 cases: there was demineralisation and erosion of the sella in 8, separation of the sutures in 3 and both changes in 5 patients.

Cerebral pneumography and computer tomography disclosed dilated ventricles in 17 cases. The tumour was demonstrated in all cases in the study. The CT-scan enhancement pattern for the histologically verified tumours had no predictive value regarding histology.

In 23 patients cerebral angiography was done. Stretching of the posterior choroidal arteries, distorsion and hypertrophy of the thalamo-perforating arteries and elevation of the thalamic veins have localised the mass in these cases. The presence of pathological circulation on angiography in histologically verified tumours also had no predictive histological value.

Treatment

The treatment of the patients in this series was not uniform. Seventien patients required placement of cerebrospinal fluid shunts at the time of first presentation because of intracranial hypertension. The initial shunts inserted included 13 ventriculo-atrial shunts, 2 ventriculo-peritoneal shunts and 2 ventriculo-cisternal by-passes (ventriculo-cisternostomy).

A summary of the treatment in the 27 cases is presented in Table 2. Four patients did not have any surgical treatment for various reasons. 23 patients had one or more operations on the tumour; the definitive surgical procedure was stereotactic biopsy in 16 cases. Two of these had already had an open biopsy which did not provide adequate material for a histological diagnosis. An open biopsy was done in 5 patients and partial resection in 4 patients. There were no operative deaths. Twenty-two patients had histological confirmation of their tumours by surgical biopsy. Of these tumours 13 were malignant and 9 were benign. They were classified as either astrocytomas or glioblastomas.

Table 2. *Summary of Procedures*

No surgery	4
Stereotactic biopsy	16
Open biospy	5
Partial resection	4

Results

Survival data are summarized in Table 3.

Every patient with a malignant tumour died within a year. Of the patients with a benign tumour, three are still alive since 5 years and of the patients with unverified tumours 2 are alive since 7 years. As in Bernstein's series[2] there appears to be no significant statistical difference among benign tumours in the rate of survival between patients with partially resected tumours and those with biopsied tumours or between patients who did or did not undergo irradiation.

In the third group there was a slight difference ($p < 0.2$ shown by the 2-tailed students T test), where the results of radiation therapy yield a better life expectancy. It should be emphasised that this is based on the results of only five cases. More-over, the standard deviations in Table 3 are suggestive of variations among a group of heterogeneous composition with unknown histology.

Table 3. *Life Expectance*

		radiation	radiation & resection	resection	no therapy
malignant	n	5	2	2	4
	m	**0.60**	**0.95**	**0.85**	**0.80**
benign	n	6	0	0	3
	m	**3.7**	-	-	**6.0**
unknown	n	3	0	0	2
	m	**8.5**	-	-	**0.15**

Discussion

The incidence of thalamic tumours among the total brain-tumours in our tumour material is about 1% and does not differ from that found in the literature[5, 8]. Although tumours of the thalamus are encountered at all ages, the cases in our material were grouped principally in the first two decades of life at the time of diagnosis. For prognostic reasons it is very important to determine the histology of the tumour. In our series, neoplasms shown to be anaplastic gliomas permitted a much shorter survival time than nonanaplastic, fibrillary astrocytomas.

Although some authors[6, 7, 11] demonstrated some beneficial effect of radiotherapy, we found no statistically significant improvement in survival in patients with astrocytomas, which were irradiated over the non-irradiated group. Both groups, however, were very small.

Nevertheless, because of the poor outlook for patients with anaplastic gliomas and the generally accepted prolongation of survival by irradiation, we must recommend a course of cranial radiation therapy. This is another reason why establishing a histological diagnosis in all cases of thalamic tumour is desirable, whether the lesion is of low grade or malignant neuroectodermal origin, which is responsible for the considerable number of celltypes involved and also for the variations found in gliomas, often encountered in different parts of one single tumour[10]. The method of obtaining a biopsy is variable. In the literature Bernstein *et al.*[2] favours open biopsy because this method should be safer, the chance of obtaining representative tissue should be greater and there may be the opportunity to achieve a partial resection of the lesion. We prefer stereotactic biopsy and we think that this method must be regarded as a major step forward[1, 3, 4, 9].

Since computerized axial tomography has become available the decision to perform a sterotactic biopsy is made more frequently than before. In our material we

could produce representive tissue for histological examination in 15 out of 16 stereotactic biopsies. The great benefits of stereotactic biopsy are, that the operative morbidity is very low, much less than in other surgical procedures and the duration of the patients' stay in the hospital is much shorter[3].

We feel that direct operative attack, even a partial resection, is not the treatment of choice in patients with thalamic tumours. Partial resection should only be undertaken if it is absolutely necessary to reduce intracranial pressure.

References

1. Apuzzo MLJ, Sabshin JE (1983) Computed tomographic guidance stereotaxis in the management of intracranial mass lesions. Neurosurgery 12: 277–285
2. Bernstein M, Hoffmanm HJ, Halliday WC, Hendrick EB, Humphreys RP (1984) Thalamic tumors in children. J Neurosurg 61: 649–656
3. Bosch DA (1980) Indications of stereotactic biopsy in brain tumours. Acta Neurochir (Wien) 54: 167–179
4. Bosch DA, Ebels EJ, Vencken L, Mooy JJA, Beks JWF (1982) Stereotactische biopsie van hersentumoren, verricht bij 100 patienten. Ned T Geneesk 126: 1765–1770
5. Cheek WR, Taveras JH (1966) Thalamic tumors. J Neurosurg 24: 505–513
6. Greenberger J, Cassady JR, Levene MD (1977) Radiation therapy of thalamic, midbrain and brainstem gliomas. Radiology 122: 463–468
7. Leibel SA, Sheline GE, Wara WM, (1973) The role of radiation therapy in the treatment of astrocytomas. Cancer 32: 646–655
8. McKissock W, Paine KWE (1958) Primary tumours of the thalamus. Brain 81: 41–63
9. Ostertag CB, Mennel HD, Kiessling M (1980) Stereotactic biopsy of brain tumors. Surg Neurol 14: 275–283
10. Russell DS, Rubinstein LJ (1977) Pathology of tumours of the nervous system, 4th edn. Williams and Wilkins, Baltimore
11. Walker MD, Alexander E, Hunt WE (1978) Evaluation of BCNU and/or radiotherapy in the treatment of anaplastic gliomas. A cooperative clinical trial. J Neurosurg 49: 333–343

Authors' address: J.W.F. Beks, MD Department of Neurosurgery, University Hospital Groningen, The Netherlands.